

# AVIATION WEEK

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OCTOBER 3, 1949

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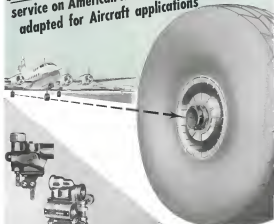
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## WHO'S WHERE

### Fairchild Restaffing

Fairchild Engine & Airplane Corp. is restoring its managerial ranks following wholesale demotions and resignations after the recent change in management. William L. Lashley has been appointed assistant general manager of the aircraft division. Fred S. Bennett is the new controller of the division, and George A. Fletcher the director of customer relations for the corporation.

Both Lashley and Bennett have been with Fairchild's aircraft division. Lashley has been with management since 1946 and Bennett has been in the division's engineering department since 1948. He now becomes an assistant secretary and assistant controller of the corporation.

Fletcher was recently vice domestic sales manager at Douglas Aircraft Co., which he joined when recruited from the Air Force in 1946.

Shortly after taking over his new job, Lashley assumed responsibility of O. A. Berthelme as his successor in the post of vice manager in charge of production of the C-119. Berthelme has been with Fairchild's aircraft division since 1947 and previously in that way with North American and TCMCO.

### Changes

Alte Memmion has been named chief of research at the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics. He has been chief of the wind tunnel and flight research division at this lab. He also was the chief of the Air Force Research Laboratory, Langley, Virginia.

W. F. Corbridge has been named chief of Wright's engine division, and E. W. Young, vice president-engineering of Wright Aero, has resigned.

Joseph J. McKim, senior assistant secretary and assistant controller of Fairchild, has been released for a temporary assignment to John P. Vance and Associates, aviation consultants. William E. Shultz, Rochester, has been named controller of Westinghouse's flight operations for United States Navy. USAF reports that Westinghouse was named.

Edwin A. Lewis has made a number of changes. Andrew G. Doherty, formerly traffic and sales manager at Detroit, has been brought to the New York headquarters to assist the general sales manager, William L. Griffith, equipment manager, who is now assistant of passenger service. Richard W. Gilbert is an engine sales manager. Herbert C. Doherty will head a new division devoted to other activities in Latin America.

### New Director

Glenn L. Martin Co. Harry S. Gordon was a director of the Reconstruction Finance Corp., Charles F. Hawley, president of the Division Chemical Corp. Charles A. Ford, vice president-director of the Martin company.

## INDUSTRY OBSERVER

(This week's column is devoted to the observations of Aviation Week editor who have been having British aircraft and engine plants for an on the spot appraisal of British progress in these fields.)

► New figures on the most powerful single jet fighter in the world—the Gloster Meteor powered by two 2900-hp thrust Rolls-Royce Avon engines—give it a rate of climb to 50,000 ft. in less than five minutes. This is just about double the present rate of climb for the North American F-86A, the latest USAF jet fighter in service.

► Although there is still considerable controversy regarding the future of the propeller in aviation, both of Britain's principal propeller manufacturers (Ratcliff Ltd., joint subsidiary of Bristol and Rolls-Royce, and de Havilland Propellers Ltd.) are investing in considerable propeller research and development facilities. The Havilland is building a new test facility in its Havilland plant aimed at building propellers for jet turbines delivering up to 10,000 hp.

► General savings between the tail pipes of the de Havilland Comet turbo-jet engine, that guided us many foreign observers at the SBAC Farnborough show, are merely temporary savings to plug the holes that will eventually be filled by two de Havilland Gyron engines for take-off boost. The Gyron is a 925 lb liquid-fueled rocket developing 5000 h.p. thrust for 12 seconds and can be controlled by the pilot from the cockpit's engine panel.

► Vickers Armstrongs Ltd. Viking transport design has turned out to be a big money-maker after a shaky start when the transport was heavily put together using fabric-covered Westland Whistler wings and Westland bomber tails. Now on aluminum jobs, 167 Vikings are in order overseas and Vickers is building 400 military versions for the RAF (Vickers) and another hundred service transport versions (Vickers). RAF will use the Vikings to replace its DC-3 transport fleet.

► The Havilland will shortly announce production orders for both its Venom (DH-112) and its night fighter version of the Venom (DH-113). Although designed primarily as a light-bomber, the Venom has proved immensely successful as a maneuverable fighter at altitudes above 42,000 ft. This is due partly to the low wing loading (147 lb/sq ft) and the exceptionally high altitude qualities of the 2000-hp Comet powered Avon V8s. The company has recently acquired a new assembly plant at Chester to handle its expanded production of the Venom series taken over from English Electric and the Chappelow, Canadian-designed primary trainer ordered by the RAF.

► Vickers Armstrongs Supermarine jet naval fighter (the Attacker) now a part of spares located on the wing just forward of the flap is a delectable device during operations for landing. Use of the spares permits pilots to maintain higher thrust output from the nose (trifling during approach) making a pickup to full power away in case of carrier wave off.

► A. V. Roe Co. Ltd. will build a small quantity of Tynes IX turboprop powered fighters for the British Ministry of Supply. The Tynes IX will be powered by four Napier turboprops (two-turboprop is mounted in the Tynes VIII transport plane, but will contain a turbine turbine wheel landing gear. Ministry of Supply plans to use the Tynes IX in its expanding program of research into operational problems and economics of turboprop transports. Vickers-Armstrongs Ltd. has completed the reform of its Turboprop Viceroy and is awaiting engine delivery from Rolls-Royce.

► British have only recently received their scheme as afterburners after having initial efforts along that line in 1948. The program is still in its infancy. The program is the Gloster Meteor and de Havilland Comet begins flying only during the past year. British officials claim they have been getting as high as 67 percent additional thrust from these afterburners in test runs, and 50 percent in flight tests.





## Douglas Skyrocket Hits Supersonic Speed

Navy again has fastest plane as D-558-II proves capable of easily passing Mach 1.

By Robert McLauren

Douglas D-558-II Skyrocket has attained the speed of sound in level flight.

The glidering white Navy research aircraft reached Mach 1.42 at an altitude of 25,000 ft (approximately 710 mph) in a one July test flight at Naval Air Force Base, Gold, Veterans Douglas test pilot Gene May was at the controls.

Unlike the Air Force's Bell X-1, which literally blasted its way through increasing drag to achieve supersonic speed, the Skyrocket performance was achieved in a smooth, normal flight, well within the plane's aerodynamic capabilities.

**Fastest in World**—Thus, the Navy Air Force competition becomes hotter, with the Navy leading itself with the latest airplane in the world. Before that, the Air Force had it.

The Skyrocket has a design capability of 1,650 mph in 75,000 ft. Such performance, if attained, not only would establish a speed record, but also an altitude record. (Maximum design speed of X-1 is 1,089 mph at 60,000 ft.)

The Navy's P-80 Sabre has gone 716 mph in level flight at sea level (Aviation Week, Sept. 12), but at the low altitude level speed is about 69 mph below that of sound. The P-80 also is intended for supersonic flight above 40,000 ft. But not for the tests for which the Skyrocket is designed.

**Not Fast Time**—The July flight was not the first supersonic performance of the Skyrocket. It has frequently reached supersonic speed in shallow dives, but this was an first level-flight breach of the sound barrier. The flight also was largely the result of enthusiasm on the part of test pilot May, since contract specifications require a demonstration of the airplane by Douglas Aircraft Company only up to Mach 1.34.

The successful supersonic flight was somewhat belated, and came after a series of powerplant difficulties had plagued the craft. Major problem in early test flights was caused by the craft's extremely short endurance, which is fully met below explanation.

**Short of Fuel**—Its wing-loading (14 rocket engine in powered wing) is a full triple of 130 mph of ordinary aviation gasoline, sufficient for an endurance of only about 30 min. The Russian MiG-15 has burned rocket engine, while of identical design to that used in the latest Bell X-1 is provided with only 3500 lb of propellant, little more than a third the amount carried by the X-1.

For this reason actual altitude times of the Skyrocket is only 12 min., of which less than 1 min. is available on full-throttle power. The rocket test time can be extended to about 14 min. by firing the chambers in sequence.

**JATO Use**—It is not to decrease the amount of fuel used for interest, as well as to reduce pilot risk, that two JATO boosters were tested on the Skyrocket last February and have been used

extensively ever since. The 3500 lb extra thrust gets the airplane off such quickly, thereby saving turbopump fuel and lowering pilot cost.

Conducted for as a part of the national placed aircraft research program, the Skyrocket was completed in November, 1947, and made its first test flight in February, 1948. Early test flights were made by chief pilot John Martin on the turbopump engine alone to establish basic stability and control characteristics of the airplane.

Rocket engine was not installed until last fall and it was the added weight of the rocket fuel that created interest in the use of JATO. Both engines were not successfully operated sometime after in flight until May, and shortly thereafter the first supersonic performance was attained.

**Fast—So far** the plane has proved capable only of slightly supersonic speed. But sustaining a combination of both wing speed and low aspect ratio platform the Skyrocket can attain supersonic speeds while flying well within its critical Mach number of 1.14.

For this reason, advancement of supersonic speed is one, for the Skyrocket, while the investigation wing of the Bell X-1 is well into drag divergence during its supersonic flight.

The Skyrocket is bigger and heavier than the X-1 although it is still a small airplane. It weighs more than eight tons fully loaded, yet has a wing span of only 25 ft., which is comparable to some Goodyear Triangles. Last version at the Naval Naval Air Force.

**Somebody**—Wise Canadian—It has been said at times for the turbopump engine, after being used before "air drier" and a negative directed simplification.

the letter designed to improve its low speed stability characteristics. Navy and Douglas engineers have accounts on several changes in this angle, including its removal to create a "straight wing" airplane because of the additional drag of the angle at high speed.

Wing of the Skyrocket is swept back 15 deg at the quarter-chord point and the stabilizer has a sweep angle of 45 deg to insure maintenance of long fuselage control at speeds well above that at which the wing suffers shock stall. Stabilizer is electronically controlled from the cockpit through a large angle to accommodate high thrust changes through the transonic area.

**Phase II**—Following the supersonic performance of the airplane, Gene May has turned the pilotage job over to other Douglas test pilots to complete the long remaining trials required for fulfillment of Phase I test flight requirements expected shortly. Phase II test will be conducted by the Navy and National Advisory Committee for Aeronautics.

Only one of the three Skyrockets has been equipped with a rocket engine, the other two being tested for stability and control on turbopump alone. But they are scheduled to fly under rocket power.

## NACA Discloses High-Altitude Gains

CLEVELAND—New research program toward the solution of high-altitude problems of turbopump, rocket and rocket powerplants was disclosed at the 1949 symposium of the National Advisory Committee for Aeronautics' Lewis Flight Propulsion Laboratory.

More than 1000 representatives of government and aviation industry heard reports that it is now possible to get satisfactory operation—including starting of these engines at altitudes as high as 75,000 ft and at speeds as high as 25 times that of sound.

**High Starting**—Key to high-altitude starting of turbopump engines is high spark energy, areas like tubes of simple diameter and one of the new P-3 jet test rocket starting at these altitudes is facilitated by "fast-starting" system, which prevents preflight combustion in chamber leading to an explosion.

Replacement of critical materials in the gas turbine is made possible by use of chromium and zirconium-nickel chemical combination which decomposes. Both are corrosion-resistant metal alloys which preserve high thermal shock resistance of the metal with high temperature resistance of the ceramic material.

**Propellant**—A new rocket propellant, aluminum-oxygen, has been tested by

the letter designed to improve its low speed stability characteristics. Navy and Douglas engineers have accounts on several changes in this angle, including its removal to create a "straight wing" airplane because of the additional drag of the angle at high speed.

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Replacement programs in theoretical methods has been made by the laboratory in the past year. Design methods are now available through the use of which substantial weight savings can be made in gas turbine design without any impairment in safety or performance.

Theoretical programs have also been made in heat transfer calculations which facilitate the study of cooling requirements of jet and rocket engines and thereby permit more efficient designs.

## House to Query Strategy and Buying

House Armed Services Committee this week will resume its investigation into military strategy and procurement, with these new items on the agenda.

**Identify** the source of charges contained in the memorandum document which furnished the investigation. Gene Warh suggested speed in source to Navy Undersecretary Don A. Kunkel, but already identified himself.

**Determine** whether the Air Force is overemphasizing strategic bombing at the expense of air-ground support.

**Examine** the reasons to record the Navy's plan for a \$199 million super carrier.

**Examine** the roles and missions of USAF Navy and Marine Corps.

**Examine** Joint Chiefs of Staff pro-

## Exclusives

- Five major exclusive stories, including the one on this and the latest report, appear in this issue of Aviation Week. Here is the list and where you will find them:
  - Skyrocket's supersonic flight, a detailed account of how fast the Douglas D-558-II, supersonic plane in the world, has flown in its early tests, an analysis by Aviation Week's engineering writer, Robert McLauren, pages 10-11.
  - The Martin X-31, pictures of this new and unusual three-jet fighter-bomber, pages 12-13.
  - The Avco C-402, Canadian jet

- transport, first detailed story on construction and performance of the plane since it has flown, an exclusive report by Technical Editor Irving Stumm, pages 15-18.
- First photographic details of new British plane, a two-page picture report from London in both Navy, News Editor, and Paul Browner, Aviation Week's London correspondent, pages 20-27.
- Turbo-prop DCA, first details of this plane to compare with the Super D-1 with a turbo-prop-powered engine, another illustrated story from London, pages 34-41.

order of having two of the services pass on security to be used by a third.

**Naval Inquiry**—Department—Naval Department's Court of Inquiry which is seeking to determine who in the Navy, if anybody, helped Warh prepare the memorandum, has been re-

Whether it will continue now depends on the House committee's decision on releasing documents contained in a special intelligence report, reported to more persons who actively and knowingly aided in preparation of the document which was critical of Air Force emphasis on the B-36 and support of the aircraft.

Previously, the staff had asked Secretary of the Warh Symposium to appear and elaborate on a statement he made before the House committee to the effect that "a series of individuals formed themselves into a group" to prepare the memorandum.

But the court's request was thwarted by Washington, who said his testimony would be done "indiscreetly" without the chairman of the House committee.

In earlier testimony, Gene Warh told the "New York" that he had prepared the memorandum specifically for Gen. William Glenn L. Martin who wanted military to show, Marshall, Secretary of Defense, Secretary of the Navy, and Secretary of the Air Force. Warh said the court to stop trying to have Secretary appear as a witness.

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## Three-Jet XB-51 Shows Unusual Design

**Martin fighter-bomber has variable incidence wing, high tailplane.**

Most unconventional jet aircraft designs produced in the U.S. are the new three-jet XB-51 ground support attack fighter-bomber announced by Glenn L. Martin Co.

A variable incidence wing on the XB-51 and the successful position of two of its three General Electric J-47 turbojet powerplants, mounted on pylons extending from the fuselage to gather with the innerbank of wing and tail section, give the whole craft a radically different appearance.

Placement of the tailfin at the top of the tailfin, and the tandem main landing gear which struts into the fuselage adds to the strangeness of the design. (No. 3 engine is mounted more conventionally as a jet in the tail of the plane.)

Use of variable incidence in aircraft wings has been subject of experiment for many years. In a sense, the first Wright Brothers' planes with wing-warping devices varied the incidence of their plane system.

► **Goodyear Place**—Probably the first practical application of true variable incidence wings was made in the Goodyear "Pre-Wing" flown during the early 1930s.

This monoplane was flown several years for several thousand hours, from Glendale and Long Beach.

Later Goodyear, in its version, used a modification of the principle in its present plane, the Midland, (Aviation News Sept. 22, 1945) and the XPG-1 bomber landing glider, both built at Dayton, Ohio. Both used the incidence of outboard wing panels.

► **German Development**—German firm of Blohm and Voorn built two variable-



incidence wing two-engine transports in France during the war (Aviation News, Nov. 26, 1945) but neither was flown. More recently British Supermarine 127 torpedo bomber and Supermarine Spitfire ground support aircraft also have used variable incidence wing construction.

► **Black Development**—Each of five sets of variable incidence last been for different purposes but have advantage over a fixed incidence design on the XB-51 is to permit island and land of the engine in a new horizontal attitude in order that both landing gear units can be fully utilized. During either of these high lift conditions, a fixed incidence airplane must usually pitch its nose high, placing the tail fin in the danger "stall" position.

With a tandem landing gear design, it is desirable that both units carry load simultaneously. Variable incidence wing on the XB-51 also permits greater island and lower landing. Forward wing mechanism would also permit upward maneuvering, such as in pulling over a low level bomb or strike run. Further, it allows slightly higher cruise speed by permitting the airplane fuselage to assume its maximum drag attitude while the wing is at its own low lift incidence.

Principal objection to the device is the structural problem involved, since one of the wing spars must be movable about the other. While some installations have moved the rear spar, the XB-51 design rotates the front spar—which is more lightly loaded with a swept wing configuration—about the rear spar.

► **More Patents**—No details are available on the mechanism but the many patents moved for such a device over the past 40 years are certain to have caused Martin engineers and designers considerable head-scratching during the design.

The XB-51, in other respects, is the last of the wartime jet aircraft projects approved by the Air Force on the basis

of a random proposal in contrast from the product of a technical requirement.

Martin engineers never have been quite certain regarding the detailed technical requirements of the airplane. It began as an Air Force design study in 1945 and this study was transformed into a prototype construction project as the XB-51 attack plane. This was one of three such projected attack planes, the Curtiss X-91 (which later became the XP-91) and the Convair XA-44 (which became the XB-44) being made in two-seat attack planes. Absorption of the attack category last year resulted in re-designation of the XA-44 as the XB-51.

► **Wing Spools**—The XB-51 wing features this set of spools for lateral control, although the design used is very like a flat plate forward of the trailing edge flap, as possessed on the Martin AM-1 Mauler. Desired variation in attack force is provided by two "trimming" struts at the extreme wing tips. The lower trailing edge panels also provide lateral control when both spools are at their maximum position during low speed. Flat white air foils are provided on either side of the air foils.

Sliding door also stop the flow and give more turbulence at slow speeds and maintain maximum longitudinal control when it is most needed. This location which structurally difficult, has had several installations in the Curtiss XP-91 and the German DFS-346 (copied by the Russians as a special case research aircraft).

► **Five Power**—Announced about the XB-51 is movement in an interchangeable arrangement of eight 500-hp. or four 1000-hp. engines in the nose. A stretch of fuselage up to 12,000 ft. is covered in the bomb bay located between the main landing gear units. Crew of four includes pilot in bubble canopy atop fuselage and observer who operates located at a station with an airframe behind and below the pilot.

XB-51 has a nose span of approx-

imately 55 ft. and a span, 50 ft. long. Gross weight is expected 80,000 lb. Top speed is 600 mph. at sea level.

Craft features 15 deg sweep in its wing and empennage. The bomb bay, first developed on a modified B-17 bomber and incorporated as the Martin XB-45 and Boeing XB-47, folds inward and into the fuselage barrel, retractable wing loading gear units retract wingtip drainage during ground maneuvers.

Air intake for the jet engine is to extend stop the fuselage. A temporary nose boom is presently in place over the inlet, since the tail engine will not be used during initial test flights.

## Swivelling Landing Gear

Swivelling wheels in the unusual landing gear field in the improved model of the Goodyear swivelling compound wheel for DC-3 type planes which now has a swivel-pivot control to enable the main wheels automatically swivel at the pilot's pleasure, for greater ease in taxiing.

Art Chipman, Goodyear test pilot who has done virtually all the flight work for his company on this three-year development, demonstrated the swivelling gear on a Goodyear-owned DC-3 at Washington National Airport recently in satisfaction of CAA, Air Force and industry officials and one of American Wings' efforts.

Advantage of the new hydraulically-operated lock, which transforms the swivelling wheels into steerable ones is obvious when the plane is taxed.

If the pilot leaves the lock in its "fixed" position, the wheels turn with the fuselage at a crosswind landing, so that the wheels will be free to swivel. Control is not unlike those familiar to pilots for use with full swivelling tail wheels which alternately can be locked for steering.

Goodyear now has produced approximately 100 sets of the DC-3 use nose wheel gear which are being marketed at a price approximately around \$6,000 installed. Currently, the company has installed seven big sets on demonstrator airplanes. This includes planes used by Goodyear, CAA, NACA, Canadian Pacific Airlines, the Australian government, Boeing Corp. (the one with its Zero-Killer device), and the Goodyear Canadian company.

Apparently 500 swivelling sets of compound wheels, in addition, have been shipped that far for use on a wide variety of personnel transport.

Details of the Langley assignment which permits the Goodyear compound wheel to center freely within sides governed by stops, have been previously reported in Aviation Week.





because of greater fuel consumption, would be substantially higher than those with piston- or turboprop-powered turbo props, these would be considerable savings to induce costs due to the jet burner's higher block speed.

An example of the craft's application could be illustrated in the high density Los Angeles-Pan Francisco run. Aero technicians estimate that jetburn block time would be 14 hr (at a cruising speed of 400 mph), DC-8 block time, 14 hr., and 2 hr., 5 min. for the DC-4, showing a saving of 1 to about 1 1/2 hr. with the jet craft.

► **Operational Benefits**—These are the advantages Aero Tech will be seeking as the jetliner because of its basic features.

► **Jet power**—No propeller purchase, overhaul or maintenance costs; operation possible on wide range of low-grade fuels; simple engine maintenance, making quick change possible; almost any length of consumption; engine and control simplicity; increased aircraft reliability; shorter maintenance, offering reduced weight and ease of loading and servicing; no reactions in parasite and induced drag.

► **Higher block speeds**—Fewer aircraft required to handle a given amount of traffic; reduced investment in airline equipment; reduced crew expense for a given mileage; and savings in dispatch mileage.

► **Passenger appeal**—Quiet cabins, high pressurization, giving sea level conditions up to 23,500 ft., permitting barometer from 23,500 ft. with no passenger discomfort, "open world" high flying, no being charged over a system, and true trans-continental reduced flight appeal. Cruising speeds above

400 mph, exceptionally high rate of climb, high acceleration possible in takeoff, normal landing speeds, engines can be started in as up to cruising altitude, and full directional control with any two engines in operation, little tendency to yaw.

► **Performance**—At 60,000 lb. gross, actual sea over 70 ft. altitude, at sea level under ICAO conditions, is not more than 7100 ft. At maximum load

ing weight of 52,000 lb., landing distance from a height of 50 ft., under worst conditions, is expected to be 1270 ft.

► **Feasible Details**—The jetliner's overall structural makeup is simple and straightforward. Use of complicated cuttings and fittings are avoided, and, wherever possible, standard steel and aluminum stock is employed.

Fuselage, about 16 ft. in diameter, is a parallel-cylinder construction. Its approximately 60 panels of its length fit four main components: nose, front-center portion, covering the master wing, aft center portion, and tail section (including lower fin)—are bolted together.

To obtain higher strength for the fuselage longer span, struts are external to the outside fuselage flanges, thus eliminating cutouts and preserving strength continuity. Forward air speed of approximately 30 in. in the passenger cabin. Fuselage structure is stressed at 16.6 psf.

Entrance doors for passengers and crew are located on the port side at each end of the main cabin. An additional loading door can be provided on the starboard side for the main baggage compartment. Passenger cabin windows are sun shading circular double pane.

► **Flight Deck**—Windshield structure is a high-strength aluminum alloy cutting. The three center panels are of sand web construction, incorporating the "NESA" system of electrical interfacing. The vinyl cover insures pressure being

transmitted in the cabin in event of wind shield damage.

Windshield results on the nose cone has shown a critical Mach number higher than that of the wing.

Instruments are grouped in second stage with up-to-date requirements of radio navigation and autorouting and bleed loading aids. Main electrical panel is in the rear within easy reach of either pilot or copilot. Air conditioning unit panel is to the left of pilot and oxygen and drawing control panel to right of copilot. Circuit breaker panel for both electrical and radio equipment are, accessible on the aft flight deck bulkhead.

Each seat is adjustable fore and aft and slides back for crew access. Offset control columns avoid obstructing pilot's knees.

Main access barriers are located on the floor aft of cockpit. A jump seat, hanging on the battery box is available for an observer.

► **Cabin Layout**—In the projected 60 ft. passenger room, double reclining seats of the standard type, with legged center area, would be arranged on each side.

For high density work, it is expected that up to 50 passengers could be carried by using 5 seats abreast, with a 19-in. aisle clearance.

In addition to individual reading lights on underside of the luggage rack, cabin illumination would also be by ceiling lights and indirect underseat lighting.

A stewardess position is planned for the aft end of the cabin, with a folding seat and table. An instrument panel is located here for a temperature indicator and control, altimeter, oxygen flow indicator, and clock. A panel with call lights and lighting switches will also be

provided, as well as telephone intercom connection with flight deck.

► **Air Conditioning, Pressurization**—These are integrated into a completely automatic system. Either filtered air from an air source or bleed air from the cabin supercharger, one on each power plant port box. Each supercharger has an air capacity of approximately 30 ft. per min. at 50,000 ft. against a cabin differential pressure of 5.5 psi.

A constant air flow of about 60 ft. per min., at all altitudes is maintained by automatic regulation. Either supercharger is capable of delivering that flow up to 33,500 ft.

Automatic control of cabin pressure is maintained by a discharge valve, set to provide sea level conditions up to 23,500 ft. At 30,000 ft. cabin pressure is equivalent to 4000 ft. altitude.

Ventilating air is temperature-controlled by equipment in the accessory compartment. (Heat is supplied by a combustion type heater of 200,000 Btu per hr. capacity. Cooling is ac-

complished by means of heat exchangers and a cooling turbine.)

Tempered air is distributed to the cabin through the main supply duct to rail ducts which utilize the space between the wingline structure, bleed air and the cabin trim. Air is discharged above head level through a grille in the baggage rack. Air exhaust from cabin to outside occurs in through floor board grilles. The air is finally discharged through a sides on the fuselage bottom.

► **Wing**—Since the plane was designed as a medium-speed transport, a one-piece load is made between high and low speed characteristics in operation of the airfoil. It obviously was essential to add the drag to a maximum and at the same time, obtain the high lift  $C_{L_{max}}$  for takeoff and landing performance.

The wing section was a compromise truly that, NACA seven series, offered no viable load storage capacity. It can be altered to have very high lift overloads

## XC-102 Jetliner

### Basic Data

#### Dimensions

Wing area	1,187 sq ft
Wing loading at 60,000 lb. gross	51.8 lb./sq. ft.
Wing span	98 ft. 1 in.
Aspect ratio	9.31
Fuselage length, overall	82 ft. 9 in.
Fuselage diameter	16 ft.
Wheel track (main)	22 ft. 6 in.

#### Control Areas

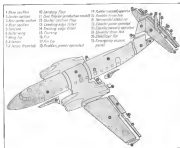
Altitude	51.9 sq. ft.
Wing	251.2 sq. ft.
Engine, total	56 sq. ft.
Fuselage, total	122.0 sq. ft.
Rudder, total	38.6 sq. ft.
Total dorsal, fin & rudder	361.2 sq. ft.
Landing flap, outer wing	105.2 sq. ft.
Landing flap, center section	21.6 sq. ft.
Drive flap, rudder (production version)	15.4 sq. ft.
Total landing flap area, outer wing and center section	126.8 sq. ft.
Total drive flap area, rudder and center section	37.2 sq. ft.



LOW NACA-7, Large panels make maintenance easy, and



ENGINE REMOVAL is simple with sling through top of nozzle.



1. Nose section
2. Landing gear
3. Outer fuselage
4. Landing gear
5. Landing gear
6. Landing gear
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29. Landing gear

characteristics—necessary for that flying  
in rough air

Winkler was considered but did not seem to offer any great promise, because although it gave slightly better stall characteristics, the cost of the extra induced drag at high speed was less favorable, and manufacturing difficulties would also be increased.

The extended wing skirt takes care of hoseage sprays and prevents preharvest root rotting. On the production version, wing skirts will have an outlet for carbon heat, permitting removal of the air while on hoseage belly, far more compact work.

The wing is built in three main sections. Center portion is integral with the fuselage center section and carries the four powerplants. It is a conventional two-spar structure with chordwise ribs and heavy gage skin. Spars are main beams, solid sheet with bone. Out-

The problem of leachate storage was solved with extruded, injected and blown applications of soilmat made by Minnesota Mining Mfg. Co.

Alarons extend approximately 51 percent of the outer wing-span, are unbalanced aerodynamically, and are power-assisted hydraulically in the ratio of 5 to 1. Internal main balance and a manual trim are fitted.

The split-type landing flaps are hydraulically operated. Additional split-type droop flaps are fitted on the outer wing, and are also scheduled to be in-

installed on the left section of the nacelle is the production version. The split flaps on the center wing can also be used as leading flaps.

► **Double Rollers, Elevators**—The conveyor comprises an upper and lower line in motion with high horizontal stability, double rollers and double elevator surfaces.

Lower fin, integral with the baseplate, is a two-part, two-boom, stem-rod arrangement, with extra bracing plate for torsional rigidity. Stabilizer, also of two-part design, is attached to the

lower in by high inside steel pins through steel end fittings parallel to the spar. Top portion of the fin is fastened to the stabilizer by the same method.

Questions are parabenized to the

blower, and have a double surface air-magmatic functioning from zero to "up" to accommodate for adverse CG in a loading floor condition. Rear surface is operated manually, while the auxiliary (front) surface is power operated. Electronic transducers are fitted, which can be operated manually, if desired.

Rabbit compensates two unlabeled surfaces, the narrowest head-operated, and the auxiliary (front) power-operated. Both are carried on piano hinges on the post side. Normally, the manual surface, only is required, the auxiliary surface being brought into play only in the event of cage failure at low speeds. A test tub is provided, which can be manually operated during operation of the manual surface, and electrically operated when the auxiliary surface functions.

On the production version, the normal elevator or rudder porting would reach the end of its travel and then cause the power-operated system to come into play.

\* **Pomacanthus**—Four Dorsal 5 jet engine are mounted in pairs in two under-wing nacelles also housing the main landing wheels. Each engine is rated at 1900 lb static thrust at sea level, ICAN certification.

Accessories driven by the engine are mounted on each axle as a gear box located between engine and attached to the wing front spar. Oil tank and oil system are an integral part of the engine.

Upper part of the cowl is a permanent structure provided with small access doors for an engine sling, and a large door to permit access to the upper part of the accessory gear box. Lower half of the cowl consists of large panels swinging to the side of the nacelle and one panel swinging to the rear, providing excellent access to engine and accessories. Panels are locked via push type, quick release fasteners. The two main panels can be detached

Each tire can be replaced in about 15 min. by unscrewing the jet pump, drive shaft, connector, detaching the engine from the mount and lowering it directly to an engine dolly.

The jet ascends slope down 7 deg. to bring the pt line of action as close as possible to the normal CG position.

The methyl bromide combustion provides for two shafts to each engine. A carbon dioxide fire extinguishing system is provided for the gear box compartment.

A water methanol system is utilized to increase thrust for takeoff under hot weather and power at altitude conditions.

- **Fuel System**—Each group of two 48 gms has its independent fuel system

Fuel from any tank, however, can be delivered to any engine. The system is installation is simple and handled through two selector switches, each operating selector valves. When set for start up, they need not be touched until all fuel is sent from the four tanks. If switch is set at subload tank, the selector valves are sequenced from outboard to inboard tank, then to engine. Setting would be for outboard tank only when that tank's fuel was to be used for any two or all engines.

A signal light system permits pilot to check instantaneously the operational condition of the fuel system on a diagram located at the top of the central instrument panel.

Find gives moderate quantity of fuel in the tanks to within 1 percent. Any appreciable difference in weight of fuel carried on either side of the aircraft is indicated by a warning light enabling pilot to correct the gross imbalance.

► **Hydraulic Systems**—This operates at a normal pressure of 1500 psi. Cut-out pressure is 2100 lb. plus or minus 300, and relief valve pressure is 2700 lb. plus or minus 100.

Power is via two constant-pressure, variable displacement, engine-driven pump/pending displacement against load. Operated by the main system are undercarriage brakes, associated steering gear, landing gear, dive flaps, and other major functions.

In addition, an electronically driven hydraulic powerpack is provided for redundancy in the event of main system failure.

► **Anti-Icing Systems**—A high capacity alternator mounted on each engine generates surplus power to the anti-icing system comprising shrouds with embedded air pads attached to the leading edges of outer wing panels, fin and horizontal stabilizer, together with cycling relays to turn power on and off and cyclic protection units.

A warning light system is installed to indicate improper functioning of the system. The alternator has voltage regulation and temperature protection and has an additional side, unit which senses vibration, operation at the

► **Undercarriage—Newstead** and co. (www.newstead.co.uk) have developed a new undercarriage for the machine, which will be available in the near future.

which travels into the air cavity in front of the forward pressure bulkhead while the main duct, hinged adjacent to the wing rear spar, retracts forward between the spars and in up position lies between the sub wings.

# New Jet Engine Oils



**Another PLUS for Socony-Vacuum!**

**A** FURTHER in aircraft lubrication since the Wright Brothers' first engine, Socore-Vacuum continues to keep pace—pioneering jet engine lubricants—developing oils that surpass Air Force Specifications—used in the latest jet fighters and long-range jet bombers.

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purpose Oil No. 1. It is refined from the finest grades... has high oxidation stability, maintains its protective body at high operating temperatures. flows freely at 70°F below zero—two important features needed for turbo-set engines.

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**ON U.S.**  
**AIR LANES—**

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South Wind Production Facilities are specifically adapted to the specialized techniques of aircraft parts production. Only government certified welders, for example, work on South Wind aircraft heaters. This high-level training of the labor results in an aircraft heater which requires top-notch precision and skill to withstand the great thermal stress of exhaust-gas flow in high-altitude operation.



United States Air Force Standards are met by every South Wind aircraft heater, regardless of whether it is built for military, commercial or civilian use. Strict government inspection is satisfied before any South Wind heater leaves the plant for aircraft installation. That's why manufacturers of the nation's leading aircraft depend on South Wind heating equipment for utmost safety, maximum efficiency and maximum dependability.

South Wind stands ready to help you solve your aircraft heating problems. From 25,000 to 800,000 BTUs per hour, South Wind Heat Exchangers or Combustion-type Heaters are adaptable in any type aircraft. For specific model information or expert assistance on development or production work, write now to the South Wind Division, Stewart-Warner Corporation, Indianapolis 7, Indiana.

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AIRCRAFT HEATING AND  
THERMAL ANTI-ICING EQUIPMENT



## How Models Cut F-90 Development Cost

Accurately scaled test models have played an important role in the design and development of Lockheed's F-90 two jet fighter-attack in the Air Force fleet.

Although the craft is slated for flight testing at Muroc for almost a year, much of the data which ordinarily would have to be gathered in the tests already have been obtained with these perfect models.

For example, dropping the models from altitude have afforded about half the information normally supplied through only one test. While cost of making such a test vehicle was high, since it was destroyed in a single flight, Lockheed engineers estimate that many thousands of dollars were saved with

reduction in amount of testing normally required with the completed plane, not considering the insurance of damage.

Malware and appliances of these scale configurations in the advance test program are shown in the accompanying photos.

**1** Production line for F-90 drop test models, prior to final development of the aircraft. Supporting units are constructed of steel and plastic and are joined to within five thousandths of an inch accuracy.

**2** Lockheed engineer uses miniature scale model to investigate vibration frequency of F-90's swept airfoil. All parts of the structure were studied to determine response to vibrations and

buffeting expected in maximum speed

**3** Scale model attached, inverted, to half of F-18, to be carried aloft and dropped from 35,000 ft for high speed descent. Flight characteristics were observed via radio tracking. Tiny radio within model transmitted continuous control force on load data.

**4** Another scale model is checked in Lockheed's 300-mph tunnel for landing characteristics with gear and flaps extended and with tip tanks installed. Other runs were conducted to study flight characteristics. Other tests were run at Caltech's large supersonic wind tunnel and in Air Force's Dayton open tunnel.



## Plastics Proving

How stepped-up testing is done by National Bureau of Standards.

Increasing use of laminated plastics in aircraft parts such as bulkheads, partitions, wing propellers, wing flaps, and doors has created the need for more comprehensive data on effects of weather, temperature, and handling on properties of these materials.

To evaluate these plastics and prepare adequate specifications, the National Bureau of Standards, under sponsorship of the National Advisory Committee for Aeronautics, conducted a study to determine effects of outdoor weathering, accelerated weathering and accelerated service conditions on the weight, dimensions, and general properties of representative plastic and associated poly-ester resins.

The accelerated weathering testing specimens were subjected to cycles of ultraviolet light and fog, while accelerated service tests consisted of cycles exposure to various temperatures and relative humidities.



"MORE" PROP FOR SAME DIAMETER

New Cessna Electro 150 propeller, with blade actually faster of 150 in speed 75 in former models of same diameter, has been approved by Civil Aeronautics Administration for unsupervised operation up to 1,700 and 1,700A Cessna's up to 1,870.00 ft. per sec. New design embodies more of better blade area allowing greater thrust, particularly for climb and climb, and shorter climb-out. New standard flight with this prop is reported, with boost in place.

► **Plastics Studied**—Test materials were conventional plastics and a reinforced-fiber-filled plastic plastic, types commonly employed in aircraft. These materials were first figure following the designation in average thickness in mils: acrylic, density 1.18 g/cm<sup>3</sup>; (no third, number of plies).

Class I acrylic, unsaturated polyester, 120, 170, 7.

Class II acrylic, unsaturated polyester, 140, 150, 1.

High strength paper plastic, 121, 147.

Grade I phenolic (tuffon fabric, reinforced), 125, 134, 19.

High strength paper, phenolic, 124, 147.

Melamine-formaldehyde, unsaturated polyester, 151, 127, 7.

Grade C phenolic (tuffon fabric, reinforced), 122, 136, 7.

1 reinforced-fiber-filled plastic: reinforced polyester, 145, 177, 6.

Laminated paper, 125, 136, (included in series is a control on weight of tests, because of the known dimensional stability of this type of plastic).

Melamine-formaldehyde phenolic resin, reinforced, 121, 177 (specimens and in direct form prepared from a molding compound, while all other specimens were laminated sheet).

► **Test Conditions**—Sets of specimens, mounted on rods at an angle of 45 deg. facing north were exposed to outdoor weathering on the roof of an NBS building. At the end of two years, weight and dimensions, and general properties were determined on these specimens.

In the accelerated weathering test of alternate exposures to ultraviolet light and misty atmosphere, one set of specimens not used to measure weight and dimensions. From another set, general properties were determined after exposure to simulated conditions for 150, 240, 360, and 480 hr, respectively.

For accelerated service tests involved exposure to cycles of temperature from 70 to 175 F., relative humidity from 5 to 100 percent, and ultraviolet radiation. In each of the tests, weight and dimensions of one set of specimens were removed after 1, 3, 5, and 10 cycles.

The general properties were determined on other sets at the end of 5 and 10 cycles.

► **Changes**—Changes in weight, dimensions, and general properties were the criteria used in analyzing the data obtained during the investigation. In most of the tests, changes in weight and plastic dimensions were negative, any positive changes being measured as thickness. There were several instances where an increase in general strength resulted from accelerated weathering and service conditions. This strength increase was attributed to further cure of the resin.

Results of laboratory aging tests did not, in all cases, correlate with the results of outdoor weathering. A laboratory simulation procedure for a material must therefore be selected on the basis of the materials, properties to be determined, and conditions of service.

An accelerated service test consisting of alternate exposure for 24 hr. at 175 F. and 75 to 100 percent relative humidity, followed by 24 hr. at 175 F. and a relative humidity of less than 5 percent, was the most severe used in the investigation. All materials, except the phenolic-fabric plastic laminate, increased in thickness during the tests. Only this material increased in flexural strength and flexural modulus of elasticity on exposure to this accelerated service test.

Adhesive-fabric plastic and glass-fiber, unsaturated polyester laminates were the most resistant of the materials tested. The paper-fiber plastic laminates were not so stable in weight and thickness after outdoor weathering as the other materials tested. These results indicate that the most resistant laminates are those made with materials which are least affected by water.

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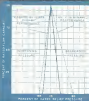
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# IMPROVED RELIEF VALVES



## for Aircraft Hydraulic Systems



Internal pressure regulation from check point to pressure relief is proof of Vickers Balanced Piston Relief Valve's considerably less than pressure by AN Standards. This pressure less pressure differential is required between relief valve setting and relieving valve pressure. *Oilfield* Care showing extremely low internal leakage of Vickers Balanced Piston Relief Valve.



These Vickers Two-Part Balanced Piston Relief Valves (AA-31300 Series) have internal leakage characteristics which are less than required by AN Specifications. Flow rated capacities (2, 4, 8 and 24 gpm) are also greater than required by AN Specifications (1.2, 2.5, 5 and 15 gpm respectively), yet dimensionally they comply with the AN envelope. Temperature operation range is from -65° to +160°F with approved AN type hydraulic fluid.

Smother operation and greater accuracy throughout a wide range of pressure adjustment are other important advantages. Operating pressure range is adjustable from 500 to 4500 psi without parts change.

Ask for Data Sheet No. 123147.

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Engineers and Builders of Oil Hydraulic Equipment Since 1921

## Fog Preventer

### Claimed by Inventor

A West Coast company claims to have developed a process which would carry a guarantee to bring about a 15-percent reduction in fog over a 12-month period at any airport.

Known as Hygrolite, the process reportedly has been tested successfully at Calverton's San Jose and Sacramento Municipal Airports. It depends primarily on a "smooth compressed solvent" invented jointly by C. B. Plank, Sr., president of Hygrolite Corp., San Jose, and his son, secretary of the firm.

► **Preventive**—The process works on the principle of producing "fog-like aerosols at vital retarding points in the meteorological cycle" to create atmosphere conditions named to fog. It is said to be most effective when employed in a preventive rather than dispersal measure.

According to Plank, weather conditions at a particular airport and size of the field determine location and number of units needed. Each installation is contained in a 4 x 4 x 6 ft housing which can be designed for placing underground or for siting on a rooftop.

The company states that, during a three-month test last winter, Hygrolite reduced by 57 percent the number of hours Sacramento Airport was closed to entrance. Eight compared with average closed hours of the same months in the previous eight years.

► **Seems to Work**—To suggestions that, by coincidence, clear weather just naturally prevailed, Plank does not deny. At the time, Plank's asserts that events surrounding the airport experienced some of the worst fogs in years.

To back his claims, the inventor points figures which show, with Hygrolite installed for two months, average visibility and ceiling at San Jose Air port was 53 percent better than at Moffett Field, only eight miles away.

The firm already has approached the Civil Aeronautics Board to secure a permit to install its equipment at Washington National Airport. It also is attempting to interest the Port of New York Authority in renting units at La Guardia Field.

It has offered to pay costs for installing the equipment if, after six months, Hygrolite does cause up to requirements.

► **Non-Flammable**—Plank claims the elusive nature of his process makes it difficult to patent, while he can secure certain parts of the equipment, he can not patent the principle on which the process is based. For this reason, he says, details of Hygrolite operation cannot be revealed.

AVIATION WEEK, October 5, 1961

# THE SPOTLIGHT IS ON

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**AIR HORSE:** Detailed are details of the double tail on Cessna's large helicopter, said to provide superior directional stability and better control.



**APOLLO:** Small diameter of Armstrong Siddeley Mauchly turboprops (1400 hp. each) is shown in good storage here.



**SKEETER:** Autor hub details on Cessna's Skooter 500 II helicopter.



The tiny Skooter's cockpit is very clean and attractively styled. Good visibility is apparent.

## Camera Probes Details of New British Planes

The Society of British Aircraft Constructors' recent show at Farnborough, England, brought out the most interesting British aircraft designs. Reaching

the opportunity for leaving British design progress, Aviation Week assigned its news editor, Robert B. Hays, to on-the-spot coverage. Their exclusive

photos were taken by Frederick B. Howells, McGraw-Hill's chief correspondence in England, with the advice and assistance of Hays.



**WYVERN:** Aviation Week's Bob Hays points to tail boom on Wyvern fighter.



**METEOR:** Demand requires on the speed Gladiators in flight with afterburners (or jets in Britain). Installation is easily fitted.



**VENOM:** Mechanics have easy access to inside of new DH fighter's engine, instruments and armament. This model is first.



**VISCOUNT:** Doors swing open on Dart turboprop shows engine mount structure.



Engineers evidently paid a lot of attention to designing Hermes turboprop cooling, shown here "perched".



**METEOR:** New tail on Mk. VII fighter to ease initial Mach number on the Gladiators.



Normal tail on Mk. IV Meteor clearly points up extent of modifications made on Mk. VII shown in photo at left.



Buck

# Rogers come true

Imagine you are Captain Buck, test pilot. You squeeze into the cockpit of a swept-wing turbojet. You check your instruments, jiggle the controls, signal readiness.

You start down the runway and pick up speed. Suddenly, your plane seems to stand on its tail like a maddened shark and hurtle straight into the sky. Behind you stream two plumes of billowing vapor.

Minutes later, you are in thin air, traveling at the astounding speed of one mile every six seconds!

Fantastic? Not at all!

JATO (jet assisted take-off) is only one of the many amazing developments of modern aviation. In fact, every art and science known to man is applied in modern aviation.

More than any other industry, aviation reaches into the future. That's why, today, it is a golden opportunity for manufacturers.

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*Look to the Sky  
for your market*



## NEW AVIATION PRODUCTS



### Conduit Assembly Aid

For soldering ferrules to flexible conduits, special bench fixture, offered by Derr Mfg. Co., Compton St., N. Hollywood, Calif., is designed to assist in measurements of rimped production assembly lines.

Based on principle of generating heat in conduit instead of applying it externally, device's operation is aimed to prevent cold joints, speed up production, reduce solder consumption and cut down number of touched joints.

Mounted supporting feet hold end clamps between spring-loaded struts. Matched and one of the electrode posts are hinged to permit fast loading and unloading of parts. Switch control for electrode is controlled by switch on top of fixture or by an locking foot switch, operator has both hands free for handling work and applying solder.

capable of continuous, heavy-duty operation.

Weighing only 65 lb. (less motor), device has 1-in. aluminum struts and 3-in. hole in one. Approximate speed with 1/2-hp., 1725-rpm motor is 150 strokes per min. Unit has positive single trip safety mechanism used in 4-in. models produced by company. Run can be made to repeat simply by moving the rear adjustment. Feed run across given in adjustment.

Steel construction with 3-in. a.d. tubes as replaceable brass bushings and is equipped with sliding key clutch and 20 ft. 9-in. flywheel.

Dimensions for unit are: Height, 17 1/2 in.; air space to isolator plate (in up), 12 in.; throat depth, 2 1/2 in. Removable holder plate is 4 x 6 x 8 in. with 12-in. hole in center.



### High-Amp. Breakers

Arrest current breakers, having current ratings up to 600 amp. for 250-v. d.c. models and 250 amp. for 120-v. d.c. units are offered by General Electric Co., Schenectady, N. Y. Interrupting ratings for these devices are 12,000 and 5000 amp. respectively.

Breakers are represented in automatic circuit operation up to 2000 ft. altitude. They are designed with lightning delay system current trip mechanism for use in gas-insulated circuits, and with directional or non-directional tripping for other applications. Electrically and mechanically closed units have triple insulation, with fuses incorporating anti-pump control arrangement. Plug-type indicators, behind transparent window, show when manually closed unit is tripped. Flexible rubber foot rests clamp lever.

Both moving and stationary contact tips are made of acoustical silver

tungsten carbide material to give long life and freedom from welding. Units are not to be applicable for bus unbolting, and for single or dual busbar distributing and feed circuits.



### Aircraft Antenna

A-11 VHF navigational antenna, made by Atcoast Radio Corp., Broomfield, N. J., is designed for reception of voice range and runway location navigation signals. Approved under FAA certificate No. 184-A, unit covers 107-122 mc. band with less than 2.5 db. standing wave ratio and less than 2.5 db. 50-ohm coaxial loss. Mounting is interchangeable with AS-27A/ARN-5. Antenna comes with ARC Type 15R antenna-cage equipment or can be supplied separately.

### Phenolic Laminate

Grade LRP phenolic laminate with marbled, unvarnished cotton fibers, produced by Laykane Corp., Oshkosh, Wis., is represented to have high impact fatigue factor and superior mechanical without service in electrical or chemical environments. Material is said to wear more evenly than products fabricated from conventional woven fabric fibers, plastic laminates, laminated resins. Kinds of repair clothes are evenly distributed and lay in all directions, rather than in parallel planes as in woven fabrics.

Company claims average values for tensile, flexural and compressive strength of Grade LRP exceed National Electrical Manufacturers Assn. averages for Grade L and Grade C products. Grade LRP is stated to show greatest capacity in fatigue impact fatigue values. In tests conducted by Byrdco, which consisted of dropping 1-lb. weight from height of 1 ft. at rate of 60 times/min., Grade LRP is reported to have resisted 1000 impacts in spread 20 ft. for Grade L and 100 blows for Grade C.

Material comes in 16-oz. in sheets A-2 in. thick, in 36-in. long rods, 6-11 in. diameter, and in molded tubing with 1 in. minimum i.d. and 4 in. maximum o.d. walls from 1/4 in.

### Rocker Box Gasket

Gasket material having efficient rubber content on woven Fiberglas cloth has been developed by Atcoast Process Co., New Bedford, Mass., for sealing between aircraft engine rocker boxes and covers. Product also is claimed to have many advantages in industrial applications where strength, minimum weight and thickness, and resistance to oil and extreme temperatures are important requirements.

Representative of easily withdrawn temperatures up to 550 F., material can easily be furnished in thickness varying from .003-.025 in. Fiberglas cloth without cutting weight 6 oz./sq. yd. and has minimum breaking strength of 216 psi on the wet and 306 psi on the dry.



### British Fire Truck

Aircraft firefighting tender with VHF two-way radio-telephone, developed by Pyrene Co. Ltd., Basingstoke, Hants., England, is designed to provide heavy discharge of foam, CO<sub>2</sub>, gas, or water.

Tender is capable of pumping foam at 2500 gpm. Already offered by Ministry of Civil Aviation for 18 Brit. and 40 export, tender is capable of pumping foam at 3500 gpm. Radio equipment has 10-mi. effective range.

MCA tenders are mounted on Austin Motor Co. chassis, but Pyrene states it has developed separate unit using Thompson's Nimbus TP/ACN's chassis (shown). This model has 55 hp., 6-cylinder engine and four-wheel drive.

Pyrene-Thompson tender carries 500-gal. water tank, 40-gal. foam-making tank, centrifugal water pump delivering 400 gpm. at 150 psi, 2 in. discharge, 125-hp. pump generator, two 80-ft. 4-in. canvas hoses for foam, working pressure to foam discharge nozzles are 50 lb., 800 psi CO<sub>2</sub> bottles, two CO<sub>2</sub> hose reels, each carrying 100 ft. in hose with distributor horn.

Enough foam compound is provided for 1000 gal. of water. Extra water flows external source can be brought in through pump suction reel. There is large compartment for 5-man crew, and 4 doors, two of sliding type.

## Boeing Selects

**WHITTAKER  
SHUT-OFF VALVES**

for new B-47

Stratojet



Zooming into the sky, the new Boeing B-47 Stratojet with its powerful jet engines and auxiliary rocket assist is one of the world's fastest bombers. It can take off and climb at almost incredible speed. It can carry 55,000 pounds of bombs. And it flies at better than two miles a minute. Like other outstanding aircraft, the new B-47 is equipped with Whittaker's automatic shut-off valves on the vital fuel and jet engine compressed air take-off systems. Whatever the service is vital... wherever dependability is a must... you will find Whittaker valves. Whittaker's versatile engineering staff stands ready to assist you on your aircraft valve problems. Write Engineering Sales Dept., Wm. J. Whittaker Co., Inc., 915 North Cahuja Avenue, Los Angeles 38, California.



Flows in reverse

Flows in reverse

Flows in reverse





# Reduces off-schedule plug changes



- 1 Core seated into
- 2 Gasket (bracket)
- 3 Fastener (bracket)
- 4 Fastener (bracket)
- 5 Fastener (bracket)
- 6 Fastener (bracket)
- 7 Fastener (bracket)
- 8 Fastener (bracket)
- 9 Fastener (bracket)
- 10 Fastener (bracket)
- 11 Fastener (bracket)
- 12 Fastener (bracket)
- 13 Fastener (bracket)

Air lines report that the AC-181 Spark Plug produces an important reduction in off-schedule plug change costs. Back of these reports is sufficient flying time to make it very certain that this longer life is no mere happenstance. Yes, significant as it is, this is only one of the outstanding features of the AC-181 which, combined, have won it Pratt & Whitney and C.A.A. approval on five P & W engines.

Check over the construction features illustrated. They are duplicated in no other aircraft plug.



AC Plugs for jet engines have also participated in the establishment of many speed records.



AC makes many aircraft products, all to AC's highest quality standards.

SAFETY VALVES • TEMPERATURE GAUGES • AMMETERS  
PRESSURE SWITCHES • FUEL GAUGES • OIL GAUGES  
SINKING CABLE • RAIL PARTS

AC 1000 MAIN DIVISION • 10000 MAIN DIVISION • 10000 MAIN DIVISION

## SALES & SERVICE

### Private Pilots

**C.A.R. amendment to liberalize use of small planes for business.**

An amendment to the Civil Air Regulations aimed at clarifying and liberalizing restrictions against use of aircraft by private pilots for business use will be introduced by the Bureau of Safety Regulation for approval by the Civil Aeronautics Board.

The proposed amendment would amend Federal Aviation Regulation 91.607 which, according to the Bureau, has been difficult to interpret and has unduly restricted operation of private pilots.

**Broader Meaning Sought**—The Bureau wants not only to change the wording of the old rule to eliminate confusion, but to "broaden" the scope of the rule.

Section 91.607 currently states that a "private pilot shall not pilot aircraft for hire." This is followed by an explanatory note—among the regulation "permitted during the exercise of a flight or pilotage certificate, or for hire of a business when the flight is made solely for the personal transportation of the pilot."

The Bureau has also indicated

persons to interpret their views on the new proposal by September 25.

As currently written, the new amendment reads: "A private pilot shall not pilot aircraft for compensation or hire, or in connection with any business or employment, unless the flight is solely incidental thereto and does not involve the carriage of persons or property for compensation or hire."

**CAB Proposals**—The Bureau gives the following interpretations to show how the proposed rule would apply to the private pilot:

• He may share rental operating expenses incurred during flight—one or more passengers may contribute.

• As a salesman, he may fly aircraft in the course of his employment, since the flight would be incidental to his business of selling. Samples of new chassis could be carried.

• He may fly company airplane, an airplane to reach another office of firm and may take friends or other passengers provided there is no charge.

• He may use crop duster or seed his own land, but not the land of another if he does so for compensation or hire.

• He may fly aircraft when the flight is not for compensation or hire.

• As a real estate operator, he may fly prospective purchaser to land offered for sale.

• He cannot demonstrate aircraft in flight to customers, as an employee of,

or otherwise for the account of, a person or company engaged in the business of selling aircraft. In this case, the demonstration of aircraft is not merely incidental to the employment or business of the pilot, but a integral part of the business of selling.

### Mail Adds Boost Used Plane Sales

Plane Mart, the recently established new department of Pacific Aeronautical Sales Co., with operations at Oakland Air Terminal, Berkeley, Calif., and Oakland Airport, uses a direct mail advertising program which has achieved early response about four times as great as those anticipated.

Newman Larson and Herb Ahlert, owners of PASC, set up the new organization to act as a broker for used plane sales, on a buying and resale program not unlike a used car business.

Each day their new program has brought into their office an average of six bona fide airplane prospects plus other inquiries by mail and telephone.

**Plane Mart Owners**—A 7000 acre mailing list of persons known to own or to have owned an airplane within the past three years was used to make the first announcement of Plane Mart. Each received a self-mailing questionnaire which asked him to fill out a plan sheet, his aircraft needs, what he had to sell, or wanted to buy.

"When you want to sell," said a letter which was part of the questionnaire, "the Plane Mart will send you an airplane or equipment either at Oakland or Berkeley. The airplane will be displayed prominently. It will be advertised in trade journals and by direct mail bulletins. Work by and coordination with each office will ensure its sale. All planes are stored in protected, paved, special tie-down areas."

Subsequent mailings list planes available with a footnote: "Spots does not also show listing many of the excellent and planes no longer for sale. Write as your requirements."

Larson and Ahlert, who have been operating PASC since 1917—a long time for a continuous operation in the aviation business—say nothing that original mailing list gave as new prospects are added.

**Plane Follow-Up**—They plan to send out a questionnaire twice a year, and send a list of the planes currently available for sale at Oakland and Berkeley air bases.

They believe the direct plane sales department is a necessary addition to a complete airplane distributor's business, and look for it to increase considerably the sales volume which they now have at Berkeley distributors in California and Nevada.



### LIGHTPLANE GAS STATION

Chico Smith is "pilot" of lightplane fueling station South Bay, California, one-stop service in gasoline, farm supplies, oil, and water. Station is built on 400 ft. diameter apron. Serving both private and commercial flying and permits change from base

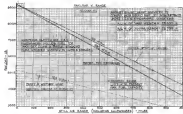
being dropped from small tank. Gasoline comes large plane out of each other's pay that. Gasoline by aviation division of Southern Oil Co. of California, it is located at Napa County Airport near San Francisco Bay.

[illegible]

# AIR TRANSPORT



MAMBA-POWERED DC-3 conversion of Armstrong Siddeley enters the busy Douglas aircraft, but offers great advantages in...



FUEL AND OIL CONSUMPTION over the performance DC-3 which can be replaced by 1953

## British Offer Turboprop DC-3

Armstrong Siddeley plans international sales effort aimed at taking part of U. S. market from Super DC-3.

By Robert Ross

RUGBY, ENGLAND—First mating of a British turboprop engine with an American airframe was displayed at Britain's aerospace show here last week by Armstrong Siddeley Motors Ltd. before an extremely interested group of British and foreign airline operators and U. S. military officials.

Armstrong Siddeley has installed two at its 1470 hp Mamba II turboprops in a standard Douglas Aircraft Co.

DC-3 airframe to develop accurate flight test data on the operational and economic differences between piston and turboprop power plants. The DC-3 was deliberately selected for the aerial experiment because of its structural as opposed to a suitable structure.

► **Five Miles Drive**—Although the govt. set acquired plane as a research job with Ministry of Supply support, Armstrong Siddeley is so pleased with the initial data obtained that it plans an extensive international sales campaign.

on the Mamba conversion aimed at the 1800-old DC-3 is still in service with commercial operators.

The Armstrong Siddeley conversion is set to set the pattern for the entire British export drive to build up foreign exchange and the initial attempt to crack the American aviation market. Robin Rye has also fitted a DC-3 airframe with two 1750 hp Dart turboprops.

Most observers familiar with both the U. S. and British aircraft industries agree that the most sensible attack for the American market came in the British aviation export showrooms on engines, not airframes or complete aircraft. The most attractive British aircraft engine available for delivery within three to six months when the initial deliveries of British turboprops at turboprop-powered aircraft ready for shipment are at least 15 to 24 months away.

Observers also feel it will be easier, at least during the next year, to enter the American aviation manufacturers in using British engines in airframes of their own design than in selling American airframes on foreign British airframes.

► **Mamba Mark II**—In selling the Mamba-powered DC-3 Armstrong Siddeley is aiming at two specific markets.

► **Airlines who now have DC-3s** and who can gain considerable operational experience in the use of turboprop airframes by converting a few of the Douglas airframes to Mambas. In fact the airline operator who is now totally unfamiliar with the economic and operational possibilities of the new power plants, could run his own tests at a relatively low cost compared with the price of buying new turboprop aircraft.

► **The hundreds of DC-3 operators who**



ENGINE ACCESSIBILITY is improved in the Mamba DC-3. EXHAUST TAILPIPE is prototype can be folded in length.

are faced with a drastic reduction in payload for their planes by 1953 in order to meet the new ICAD performance regulations. According to Armstrong Siddeley, the Mamba-powered DC-3 will meet the new regulations with a payload reduction of only 1300 lb below the present 28,000 lb maximum gross weight with a cut of 4400 lb compared with the 1700 hp Pratt & Whitney Twin Wasp piston engine now used.

► **Douglas Conversion**—In meeting the present DC-3 operators faced by the 1953 ICAD deadline, Armstrong Siddeley will offer still competition to the Douglas Super DC-3 program also aimed at converting the present DC-3 airframes to meet ICAD requirements. Armstrong Siddeley estimates that price of two Mamba piston installations, as the DC-3 airframe will be still under \$100,000 and require about 16 days. Douglas quotes its Super DC-3 conversion at less \$130,000 to \$230,000.

Douglas plans to use the Wright 1820 piston engine which has a take off rating of 1475 hp, only 57 hp higher than the present Mamba rating. For cruising, the Mamba would produce more power than it operates at slightly below its maximum while piston engines usually cruise at between 90 and 95 percent of maximum power.

The Mamba conversion involves structural modifications outside the engine nacelle. The Douglas conversion program calls for extensive reworking of the wing, empennage and landing gear of the fuselage. Under new ICAD requirements the Twin Wasp DC-3 would gross 21,600 lb, the Mamba DC-3 28,700 lb and the Super DC-3 28,000 lb. The detailed comparison of the present Twin Wasp and DC-3 with the Mamba II version under the new ICAD requirements will be published later. The figures were prepared by Armstrong Siddeley.

► **USAF F4U DC-3**—A recent increased allowance of the Mamba DC-3 was

## Mamba vs. Twin Wasp DC-3

Under new ICAD engine/airframe requirements, including increase for icing, take off, climb to cruising height and climbing, for one hour, the estimated comparative performance of the Mamba DC-3 is shown below.

Takeoff weight	Twin Wasp DC-3	Mamba DC-3
	21,600 lb	28,700 lb

	Payload lb	at 10,000 ft	at 15,000 ft	at 20,000 ft	at 25,000 ft
Range (ft)	at 10,000 ft	at 15,000 ft	at 20,000 ft	at 25,000 ft	at 30,000 ft
100 mph	100 mph	100 mph	100 mph	100 mph	100 mph
150 mph	150 mph	150 mph	150 mph	150 mph	150 mph
200 mph	200 mph	200 mph	200 mph	200 mph	200 mph
250 mph	250 mph	250 mph	250 mph	250 mph	250 mph
300 mph	300 mph	300 mph	300 mph	300 mph	300 mph
350 mph	350 mph	350 mph	350 mph	350 mph	350 mph
400 mph	400 mph	400 mph	400 mph	400 mph	400 mph
450 mph	450 mph	450 mph	450 mph	450 mph	450 mph
500 mph	500 mph	500 mph	500 mph	500 mph	500 mph
550 mph	550 mph	550 mph	550 mph	550 mph	550 mph
600 mph	600 mph	600 mph	600 mph	600 mph	600 mph
650 mph	650 mph	650 mph	650 mph	650 mph	650 mph
700 mph	700 mph	700 mph	700 mph	700 mph	700 mph
750 mph	750 mph	750 mph	750 mph	750 mph	750 mph
800 mph	800 mph	800 mph	800 mph	800 mph	800 mph
850 mph	850 mph	850 mph	850 mph	850 mph	850 mph
900 mph	900 mph	900 mph	900 mph	900 mph	900 mph
950 mph	950 mph	950 mph	950 mph	950 mph	950 mph
1000 mph	1000 mph	1000 mph	1000 mph	1000 mph	1000 mph

The engine test results of the aircraft listed the maximum attainable speeds with the following:

Twin Wasp aircraft at 10,000 ft	(1140 mph)	(1370 mph)	with 1850 hp payload
Mamba version at 10,000 ft	(1080 mph)	at 165 mph (182 mph)	W's
Mamba version at 10,000 ft	(1080 mph)	at 165 mph (182 mph)	payload
Mamba version at 10,000 ft	(1080 mph)	at 165 mph (182 mph)	1850 lb
Mamba version at 10,000 ft	(1080 mph)	at 165 mph (182 mph)	1850 lb

Mr. C. C. Bird, chief of USAF aircraft requirements, Maj. Gen. Al. Patti, director of research and development, and George Wanda, special assistant to USAF Undersecretary Arthur Brown. They indicated that USAF might be particularly interested in the possibilities of a DC-4 conversion with one Mamba, aimed at providing sufficient life, decreasing engine costs and boosting maximum range of the current USAF C-54. A U. S. Navy group also requested the Mamba DC-3. The Navy has a recent version problem on its fleet of R4D (New DC-3) transports which are now in operation.

Armstrong Siddeley believes common opinion, who are concerned with loads of 500 miles or less, will be particularly interested in the Mamba DC-3 since it will enable them to operate under the new requirements with

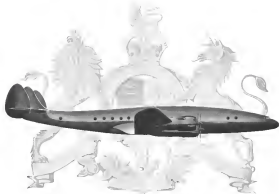
a payload only about 1700 lb under their present allowance.

The Mamba II weighs 750 lb compared with 8500 lb for the Twin Wasp and about 1450 lb for the Wright 1820 to be used in the Super DC-3.

► **Plus U. S. Test**—The Mamba-powered DC-3 has now completed about 12 hours test flying with W. E. Pusey, Chief, Air Test Pilot at the controls. It was not allowed to fly in the SIVC show which is limited to British test aircraft and expects to Armstrong Siddeley plans to bring it to North America as operators now come in with the Douglas Super DC-3 which is now on an extensive sale tour.

The two Mambas are installed with their longitudinal axis in the same position as the Twin Wasp in used. (Continued on page 41)

# The Majestic Constellation



The newest member of the Lockheed Constellation family is the Union of South Africa. This government recently purchased a fleet of three 320-seat air-bus transports for the South African Airways. Now, four members of the great Constellation family fly for the respective Constellations. Australia is represented by Qantas Empire Airways, India by Air India International and the United Kingdom by the British Overseas Airways Corp., all flying the Constellation. Eight other major world airlines also fly, and many have transferred their famous red and green livery, still the world's most renowned four-engine transport.

LOCKHEED AIRCRAFT CORPORATION, BIRMINGHAM, ALA.

## Lockheed Constellation

LOCKHEED AIRCRAFT CORPORATION, BIRMINGHAM, ALA.

affecting the forest heat. Propeller and wing sheets have been moved forward for CG reasons, lengthening the blades opposite the wingtip. This will be changed in later conversions to conform with ICAO requirements.

Maritime director of the Twin Wing aircraft has been retained for the task of maximum structural changes although the Mumbo II—its sister development—has been retained for the structural work which South African Ltd., Douglas agents in Africa, needed on the conversion.

► **Exhaust System**—The exhaust system is carried up over the top of the wing splitting to go around the main wheel fairing and emerging about midway along the chord of the upper side of the wing in two longitudinal bays. After a trial run, Armstrong Suddley feels it can reduce the length of the tailpipe without any difficulty. There has been no sign yet of any deterioration of wheel-covered control surfaces on red dirt and slush as of rubber deicing boots from the pit exhaust.

Two main cooling intakes are located on each side of the Mumbo nose. One is for air cooling and the other is used for internal cooling of the nose. Although internal tailpipe heat exchangers reach 500 degrees, it is possible to touch the outside of the exhaust pipe with your hand. According to Suddley, less than an inch away from the pipe air cools. The Mumbos are either a conventional or an electric starter and can operate on either kerosene or 100 octane aviation gas.

► **Control Simplified**—The second two throttle, two propeller and two mixture controls on the DC-1 cockpit pedestal have been reduced to two throttle controls linked with the special Armstrong Suddley automatic fuel and propeller control system and two high pressure fuel shut-off switches. Additional engine instruments include torque meters and, for type exhaust temperature gauges.

Free Over flew the Mumbo DC-1 at a gross of 25,000 lb. with full fuel load using a maximum of 15,000 rpm for takeoff and 14,000 rpm for maximum cruise. Nose level was in balance at a Twin Wing-powered DC-1 which flew for comparison with the Mumbo job. Free Over demonstrated no weight error, dirt and ice accumulation and is in the dead engine with no apparent difficulty. Fuel power is delivered to the propeller within two seconds of collecting with expectations of about cutting the time lag down to one second.

► **Expect 1500 hp**—Armstrong Suddley expects to develop 1500 hp, out of the present Mumbo with some redesign of the one of the turbine now under way. An even more powerful version—the Mumbo III—is under development but no power estimates are available as yet.

The Mumbo is expected to begin its commercial life with an overhead period of 210 hours, with an increase to 900 within a year.

At present, deicing is handled by hand using fuel oil and hot air from the front of the engine but plans are being worked out for automatic systems to provide deicing of running air in addition to the thermal deicing of the exposed engine surfaces.

► **Final Tests**—The Mumbo has passed its 150-hour military and civil type test and has about 5000 hours of trial test running with over 100 hours flight time in the Apollo airfield, Maricao, San Juan, and the Atlantic and Pacific military airfields. The Mumbo also completed a 100-hour endurance run according to official schedule with only 15 man-hours of maintenance during the test.

## Devaluation

Westbound trans-Atlantic fares adjusted to dollar rates.

Long term effect of foreign currency devaluations on overseas air travel will be beneficial, in the opinion of Warren Lee Parsons, TWA board chairman, and next year's president of the International Air Transport Association.

Devaluation will encourage American travel abroad because the value of the U.S. tourist's dollar is increased. Parsons declared. He said currency devaluation will call for country-by-country re-examination of airline rates structure but expressed confidence no carrier would be so short-sighted as to take individual advantage of the situation.

► **Rates View**—Since devaluation in the North Atlantic rate structure followed immediately after last month's 30 percent devaluation of the British pound, U.S. operators raised their London-New York rate from about 85 pounds (which equaled \$150 before devaluation) to 125 pounds, the new equivalent of \$187. But British Overseas Airways Corp. continued to show 85 pounds sterling (now only about \$140) for the westbound crossing—then underwritten by U.S. competition sharply.

IATA members immediately met in London to iron out the difficulties. It was decided that present dollar rates should continue over the North Atlantic.

Thus passengers buying a London-New York airline ticket will have to



pay 125 denval British pounds or 5070 similar rate bids over the North Atlantic were proposed for other destinations.

► **Dollar Fares.** CAB-TAT IATA agreed to maintain rates in terms of British pounds sterling within the existing area. Then dollar-paying passengers flying within Europe, to the Middle East, Asia, Africa and Australia will benefit from 10 percent fare cuts.

"This rate ship will continue at least until IAT's North Atlantic traffic conference meets in Mexico City early in November."

► **Miles Travel.** Studies-Newswatch, news for early establishment of world-wide itineraries as IATA received a temporary setback at IATA's recently concluded 50th anniversary meeting in The Hague. A traffic committee study

ing the subject reported the reduced rates would be unworkable.

Later, however, IATA decided that fare differentials can be achieved in some areas by direct and other air planes. Regional traffic conferences were advised to study lower fares in a series of leveling off with seasonal variations in traffic flow. It was also agreed that in the future rate changes might be adopted with less than unanimous consent.

Per American Airlines president Jack Leppa expressed belief that IATA members have become largely uninterested in developing the most air market. Northwest Airlines president Cris Hunter also voiced strong support for transit rates.

Next was IATA's general meeting will be held in the U.S.

► **Free Business.** Consequently, NWA has lost 70 cents mile each an 80 percent of its coach passenger. Unless there is some arrangement, the airline is undoubtedly going to lose its North American market. Putnam told John Cox, whose committee is investigating airline fares.

(A recent CAB study showed that not 60 percent but less than 15 percent of Northwest's coach passengers would have used regular fare planes if the entire service had been unavailable.)

Putnam concluded that where equipment is utilized in areas where it would otherwise be idle, operational services are desirable because a general breakdown of the rate structure does not occur.

But to regard coach service as a passenger for the industry's best business is incorrect," Putnam said.

Rates in total paid payment for U.S. domestic and international carriers from \$12,007,600 in 1946 to \$46,000,000 in 1947, \$111,521,000 in 1948, and to estimated \$135 million in 1949 (notes including transportation, according to Putnam. He said the reason for the increase was that CAB had been behind in its rate setting and 1949 appropriations reflected only partial payment by the government on its account.

► **Mail Pay Deduction.** "One cannot fully call the profits of catching up to over due accounts an increase in and pay or an increase in dependence on government. Actually, mail pay of the airline per ton mile of mail carried has gone a steadily declining trend in the last six years," Putnam said.

50 passenger DC-6s for coach flights. That at 80 percent load factor the airline would lose \$1.76 a plane mile with a DC-4 or coach compared with \$1.58 a plane mile on a regular DC-4 at 60 percent load factor.

The CAB president quoted John Cox as saying that 40 percent of Northwest's coach passengers would not have been carried by air if it were not for the law. "If 40 percent would not have been carried by air," Putnam continued, "it follows that 60 percent would."

## Putnam Says Go Slow on Coach

Declares low fare flight would lose 20-cents-a-mile compared to flight at regular fare.

Continued action should operate in the air coach field with extreme caution, in the opinion of Chicago and Southern Air Lines board chairman Carlton Putnam.

Commenting on a speech made recently by Sen. Edwin Johnson (D., Colo.), Putnam challenged allegations that the scheduled carrier have been slow to set off new coach service. He indicated that irregular carrier have shown significant gains in passenger traffic, while scheduled carriers are in a position, Putnam wrote the Senate Interstate and Foreign Commerce Committee chairman.

► **Aircraft Availability.** Here's how Putnam rates up air coach.

"A 100 passenger plane operating at 60 percent capacity the industry's average load factor in first half 1949 at the regular 60-cents-a-mile fare will raise in \$1.43 a mile. The same plane operated at 80 percent capacity at the 4-cents-a-mile air coach rate will raise in \$1.90.

"That is probably a reasonable comparison between load factors and at times on regular and coach service, with the coach operation taker at its best. The result is a comparative loss of 20-cents-a-mile on coach except under the best of circumstances. These conditions probably would not exceed 7-cents-a-mile."

► **Other Side.** Putnam's analysis, however, noted, overlooked the fact that CAB requires regulated airlines operating air coach to employ higher capacity planes. Northwest Airlines uses 50-passenger DC-4s for regular operations and



CENTRAL STARTS TO CHASE MAIL

Although centered in its first day of scheduled operations, Central Airlines and its equipment service on west segment of A&P from Fort Worth-Dallas to Oklahoma City with its single-engine Beech Bonanza. The firm had received more

than 300 lbs of mail, shown being loaded at Oklahoma City by Pilot Gordon Bookland, told the station agent of Central Airlines, who has a consolidated ticket office with Central and Sun Trans, of Central.

Putnam again attacked the proposed separation of service mail rates from "aircoach" payments. He said a low potential carrier would like to use the subsidy to allow others to other lines that they can use it as an argument to take over "unconcessional" competition. Surface carrier who would have a field day attacking opportunities increased directly for airline subsidy.

## Air Coach Started On Southern Routes

Scheduled air coach service is making its first major penetration of the southern transportation market.

Last week, Eastern Air Lines inaugurated first-class-a-mile service with late evening Superliner DC-6 flights between New York and New Orleans via Washington, Atlanta and Birmingham. On Oct. 1 the law fare operation will be extended from New Orleans to Houston.

Concurrently with EAL's air coach inauguration, Capital Airlines extended its "Nighthawk" service from New York to New Orleans via Pittsburgh, Knoxville, Birmingham and Mobile, and from New York to Atlanta via Pittsburgh. Fifty new passengers DC-4s are being used.

► **New York-Miami.** East-Coast Nov. 1, National Airlines and Eastern plan to start New York-Miami air coach service with 50-passenger DC-4s. Interim stage will be at Washington and Richmond. New York-Miami coach fare will be \$46.90 against \$77.70 for regular 60-cents-a-mile flights.

Meanwhile, Northwest Airlines has extended its DC-6 coach service to the Chicago-Portland, Ore. route. Western Air Lines is expected to start Los Angeles-San Francisco-Portland Seattle operations with high density DC-4s to non-coast-to-coast around the middle of the month.

► **East Coast-Midwest.** East Coast Airlines, active on the New York (Teterboro) to Detroit route, carrying passengers and cargo. President has been flying the New York-Miami-San Juan and New York-Los Angeles-San Francisco route.

Arnold Air Service, Anchorage, Alaska, was told to show cause why it should not be ordered to cease and desist from further violations of federal economic regulations. The company is accused of operating with excessive frequency and irregularity between Anchorage and Seattle.

Aerial Transport Corp., Inc., Boston, Calif., was ordered to stop loading the public to believe, directly or indirectly, that it operates regular flights between any two or more points. The transportation company was forbidden to operate more than eight roundtrip between any two points during any four consecutive weeks.

Five of the aircraft on C-46s based from the Air Force. The other plane is a purchased C-54. President Robert

W. Prescott will and the new equipment will be in service over the company's first coast-to-coast routes.

The Tiger fleet now includes 15 planes: four C-54s, five C-46s and three C-47s. Daily high-carrying capacity is 75,000 lb.

## Israeli Asks Permit

An Israeli carrier has asked CAB permission to start airline service between the Middle East and New York.

El-Al Israel National Airlines Co., Ltd., with headquarters at Tel Aviv writes a foreign carrier permit to fly from Lydda in the U.S. via Paris in Italy, Switzerland, France, England, New Zealand, Canada, the Azores and Canada. Organized in 1945, the company is partly owned by the Israeli government.

At present, the carrier owns two DC-4s which it has been operating to Rome and Paris. Purchase of additional aircraft, possibly DC-6s or Constellations, is anticipated, officials told CAB.

## More Irregulars Cited By Board

Extensive record shows again four more large irregular carriers charged with illegal operations has been announced by the Civil Aeronautics Board.

► **Albuquerque-Tucson.** Frontier, Santa Fe, Flag and Midwest Air Transport, Inc., Interboro, N.J., were ordered to show cause why they should be allowed to operate on routes already in operation of other airlines. The board is "reasoning and willful" violation of the Civil Aeronautics Act. The airlines allegedly have operated with excessive frequency and irregularity and perverted mail regulations despite warnings from CAB.

► **San Diego-Midwest.** East Coast Airlines, active on the New York (Teterboro) to Detroit route, carrying passengers and cargo. President has been flying the New York-Miami-San Juan and New York-Los Angeles-San Francisco route.

Arnold Air Service, Anchorage, Alaska, was told to show cause why it should not be ordered to cease and desist from further violations of federal economic regulations. The company is accused of operating with excessive frequency and irregularity between Anchorage and Seattle.

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## Davis Confirmed

Nonmember of Thomas W. Davis as assistant secretary of Commerce has been approved by the Senate. Davis is a former member of United Air Lines President W. A. Patterson. Davis was named to the post last month by President Truman. His duties in the Commerce Department will relate to the aviation part of aviation permitting to aviation.

Davis has been with United Air Lines about five years. In 1929 and 1940 he was secretary to the Postmaster General. From 1913 to 1918 and 1940 to 1942 he was employed by the Democratic National Committee.

## New Star Route Contracts Readied

The Post Office Department is preparing to let its first contracts under the star route legislation recently passed by Congress.

CAB has been asked to certify that operation of a new route from Honolulu to a larger city on the island of Hawaii and extension of an existing route from Honolulu to San Francisco, San Jose, Calif., and San Francisco to San Jose, Calif., will not conflict with development of air transportation under the Civil Aeronautics Act.

► **Repairs Made.** This proposed Hawaiian Island route, Honolulu to Kilauea, Molokai, in 54 miles long. Kilauea, the latter settlement, is expected from the start of Molokai by a 1,000 ft. precipice. Mail is now transported via Kilauea by messenger on foot.

The 400 persons at Kilauea, including medical personnel, receive about 175 lb of mail daily and dispatch about 20 lb. Post Office wants bids (in a postage bond) to operate daily mail service. The company's mail is sent from Honolulu.

The 35-mile Clarksville-N. Jones air route is operated only during bad weather when Lake Michigan is frozen over.

St. James is on Beaver Island in the Lake and carries mail service by power boat during the open season of navigation.

## Pioneer Moving

Dispossession of its present facilities at Houston, Tex., Municipal Airport, Pioneer Air Lines plans to shift its general office to maintenance base at Love Field, Dallas.

The Air National Guard, which has a 99-year lease on the feeder's Houston base, gave PNL, until Oct. 12 to move, although an extension of the deadline may be granted. Pioneer will build a hangar and other building

## New kind of Buyer Now Dominates 4-Place Market

Surveyors indicate that more and more sales in the 4-place airplane field are being made to business and professional men these days—men who haven't logged much time, and look like a rugged, safe and easy-to-fly plane.

Buyers like these are interested in a big, comfortable plane that they can fly safely themselves—and one that has maximum safety on a corporate basis. Many must make short or rough field landings a part of their every day flying, and would rather fly than land. They are also interested in the 1948 first quarter figures that show turbine lead by some in its price class.

Naturally turbine dealers are reaping increased profits from this market change.

A Ryan design illustrates one of the most generous in the industry. The product is backed by a unique and profitable service policy, and a handling national company advertising and manufacturing program.

Many of these desirable design features are available in certified business aircraft. A letter of inquiry to Ryan Aircraft Company, 622 Lindbergh Field, San Diego, Calif., will bring complete details by return mail.

on the southeast end of Lave Field, with completion expected in the first quarter of 1949.

► **Orben Aircraft**—About 100 T-2ALs are played and their families are involved in the theft. Finance Committee of Congress officials asserted that the Air National Guard could have no interest in El Estero Field instead of leaving out the airline, with its \$1,250,000 annual payroll.

Other owners are affected by the P-1L move. Chicago & Southern Air Lines listed a P-1L of P-1L's spare for servicing plans and on its Latin America route. Mid-Continent Airlines is also using the barge.

It is expected that P-1Ls will be sold for \$75,000 in selling prices.

## Nonskilled Violators

TRANSCONTINENTAL Air Lines, Oakland, Calif., and Seaboard & Western Airlines, New York, have violated the Civil Aeronautics Act in their foreign operations, according to CAB members.

Although finding the company's actions were not "knowing or willful," Executive William E. Baker and Transcon have violated laws by flying passengers in foreign air transport lines on a common carrier without a certificate. TAIL closed the flight at

issue were under contract, but Baker and they were actually common carrier in nature, but, though a contract may have been signed.

► **Volcanos Limited**—Executive Robert K. Ryan and Seaboard & Western have deeply lost the public to believe it is a common carrier. Ryan, who is now in New York in financial affairs, has engaged in foreign transportation of passengers since Sept. 10, 1947 (when such activity was banned for non-certificated operators), and has committed hard violations.

Some of 5000's violations were found to be "knowing and willful." It was recommended that both Transcon and Seaboard & Western be denied to carry and direct from further flight activity.

## SHORTLINES

► **AB France**—Now flies to all six continents in a series of direct international service from Paris to Australia and Noumea, New Caledonia, New York, Genoa, Rome, Karachi, Calcutta, Saigon and Indo-Pak.

► **Aerolineas Continentales**, 1,400,000 passengers last year, is doing the first year of domestic air parcel service ending Sept. 1.

► **Aerolineas Chusman-Harold R. Harris**, vice president and general manager, described the flight, 36-passenger de Havilland Comet as "a first-class airplane" during his recent visit to the Society of British Aircraft Constructors in England. He said that "British American manufacturers move rapidly to give eventually be necessary for U.S. operators to buy their own passenger planes abroad."

► **Cebu Pacific Air Lines**—has inaugurated scheduled service from Vancouver to Tokyo and Hong Kong via the Albatross.

► **Capital**—Together with Piedmont Airlines, a leader, has received CAB certificates to serve Newport News, Va.

► **Chicago & Southern**—A CAB answer has recommended that the carrier's application for its certificate service in Texas and Springfield, Ill., on common grounds be approved.

► **FAMA**—Plans to open a new weekly DC-6 service between Boston and New York directly with stops at Rio de Janeiro, Recife, Trinidad and Panama. The Argentine company's application for a foreign air carrier permit is now pending before CAB.

► **Mid-Continent**—Reports the trial arrangement under which, since 1946, had been operating have been in place as ground agents for MCA since July 15 is proving successful. In the six

weeks ending Aug. 31, five of the four base aircraft agents sold 53000 worth of airline tickets for Mid-Continent.

► **Norfolk**—Inaugurated East-of-the-week flight plan last month. Eastern, Chicago & Southern and Delta made similar northward flights last week were to vote on a proposal to increase the carrier's reinforced stock by 500,000 shares. The increase covers against the Air America Airways and W. R. Glass & Co. to purchase National stock.

► **Norfolk**—The 100-passenger traffic peak in August when it carried 42,000 passengers—9000 more than in the same month last year. A plan to increase its service to Boston, Montreal and New York.

► **Norfolk**—Earned an operating profit of \$794,617 and a net of \$563,326 in August, bringing its net profit for the first eight months of 1948 to \$1,668,326, compared to a net loss of \$1,603,444 in the same period last year. President Carl Hunter and September landed the carrier profitably.

► **Pan American**—Plans to inaugurate twice-weekly Westcoast service from San Francisco to Tokyo via Honolulu on Oct. 17. Cuts down to Havana during the first four months of the month, while was four times greater than in the same period last year.

► **Wisconsin Central**—Showered a \$19,411 operating profit in August. The carrier made money during six of the first eight months of 1949.

## CAB SCHEDULE

AB—Following conference in Transcon Airways certificate renewal case (Docket 102).

AB—Shifting on schedule to Western and Transcon Air Lines applications for all-cargo certificate between the U.S. and Japan and the 3000th flight (Docket 104) (104).

AB—Shifting on schedule to the U.S. and Japan (Docket 104) (104).

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## Stop the Gobble-Gabble

There must be something to this bargain fare business, after all! Seven more continental airlines introduce or extend lower passenger rates while a few die-hard skeptics stand by and say, it can't be done.

Eastern Air Lines starts its last four-city route flights from New York into the South, and will extend them further next month.

Capital opens its coach service from New York to the South and Southwest.

National Airlines and Eastern will open New York-Maine coach service in November.

Northwest extends its coaches to include a Chicago-Portland link.

Western will soon start coach flights connecting major Pacific Coast cities.

TWA wins permission from CAB to continue its DC 1 coaches a few months longer between Kansas City and the West Coast.

Trans-Canada Air Lines starts a reduced rate family fare plan.

It may well be that all of these experimental services will not pay off. But at least these progressive operators are willing to try it, and we wish them well. At least they are not spending all their time over the slide rules, proving it can't be done, or waiting only for bigger and better payments from the Post Office Dept.

The skeptics are going even farther than claiming all air coaches are impractical. They are misrepresenting the case by assuming that advocates of air coach service have been plotting it as the stroke of the millennium. Our last week, admitting an advantage or two, and hoistily, "But to regard coach service as a panacea for the industry's basic troubles is unwise!" No more that we have lost patience at the air coach picture as the sole answer to the industry's prayer. It is perhaps significant to note that this same skeptic also takes a stand against separating service rail rates from subsidy payments to the airlines.

We hope the air coach skeptics will stop setting up the "bar coach panacea" straw man in order to knock him over.

Give the air coach a chance. Whenever it works we will make progress, whenever it doesn't, we should stop it. Let's stop the gobble-gabble and the calumny howling and try to fly the millions.

## Publicity for Contracts

Today, Aviation Week often carries new industrial intelligence service to its readers. Today and monthly hereafter, we shall list the latest negotiated contracts at

\$100,000 or more, placed with industry by the U. S. Air Force.

Months ago, we began publishing USAF bid notifications, and awards made after competitive bidding. Such listings, originally requested only by Aviation Week, are now sent directly by Wright Field to this magazine, as well as other publications.

The negotiated contracts, however, have never been regularly published, and today's listings mark the culmination of a year's persistent and continuous efforts by Aviation Week to clear away the mystery from these transactions.

Our first request for such information was sent to Wright Field in August, 1948. We continued our efforts both in Dayton and Washington. Editorials on the subject appeared in this magazine Nov. 22, 1948, and June 6, 1949.

Our citations finally were made personally to Air Force Secretary Stangor, who agreed with our contention that all Air Force contracts, except a few involving secret methods or products, should be announced quickly.

Even after Mr. Stangor's approval, however, his under secretary of the air force, Arthur S. Barrows, strenuously objected to such publicity on the grounds that the government would then be unable to drive as hard a bargain with industry if individual negotiated contracts were published.

For four or five months Mr. Barrows and Wright Field blocked distribution of the contract information to Aviation Week by a variety of delaying tactics and red tape.

The flow still is not complete, and we have yet to receive listings of contracts under \$100,000, which we have also requested for publication. These have been promised, however.

We have faith in Mr. Stangor and in his determination that his order will be carried out. We congratulate the Secretary on this revision in Air Force policy, and verbatim the suggestion that if the Air Force had this subjected all of its wartime contracts to the full light of public scrutiny, the sensational Berry Myron scandal would have been detected long before it reached the astronomical proportions that it did.

We believe that any disadvantage of the kind Mr. Barrows fears will be more than offset by the long term advantages of telling the public how its money is being spent.

We remind Mr. Barrows that it has long been the practice of this government to reveal this information. No other government agency that we know of attempts to hide from the press its sensitive contracts with industry, or other general expenditures.

Robert H. Wood

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